

WHAT IS CLAIMED IS:

1. A control apparatus for an automotive vehicle,  
comprising:
  - 5 a continuously variable transmission associated with a vehicular engine, including a belt that transmits a revolution of a primary pulley to a secondary pulley, and that is enabled to make a gear shift by modifying a pulley ratio between the primary  
10 and secondary pulleys with a hydraulic;  
a belt slip determining section that determines if a slip of the belt between at least one of the primary and the secondary pulleys occurs; and  
an output section that outputs a signal to  
15 command an engine control unit to increase an engine speed by a predetermined engine speed when the belt slip determining section determines that the slip therebetween occurs.
- 20 2. A control apparatus for an automotive vehicle as claimed in claim 1, wherein the belt slip determining section determines if the belt slip therebetween occurs when the vehicle is started and the output section outputs the signal to command the  
25 engine control unit to increase an engine idling speed by the predetermined engine speed when the belt slip determining section determines that the slip therebetween occurs and when the vehicle is started.
- 30 3. A control apparatus for an automotive vehicle as claimed in claim 2, wherein the vehicle further comprises an oil pump to be driven by means of the engine; an original hydraulic supplying section that

supplies an original hydraulic for a control hydraulic that controls the pulley ratio with the oil pump as a hydraulic source; a gear shift actuator that supplies the control hydraulic to each pulley;  
5 and a gear shift controlling section that outputs a control command to the gear shift actuator; and an original hydraulic determining section that determines whether the original hydraulic of the original pressure supplying section is equal to or  
10 below a predetermined hydraulic value; and the shift controlling section that outputs the signal to command the engine control unit to increase the engine idling speed by the predetermined engine speed when the original pressure during the vehicle stop is  
15 determined to be equal to or below the predetermined hydraulic value by the original hydraulic determining section.

4. A control apparatus for an automotive vehicle  
20 as claimed in claim 3, wherein the gear shift controlling section outputs a signal indicating a demand on an output torque upper limit value to the engine control unit when outputting the signal to command the engine control unit to increase the  
25 engine idling speed by the predetermined engine speed.

5. A control apparatus for an automotive vehicle  
as claimed in claim 1, wherein the belt slip  
determining section comprises: engine speed  
30 determining section that determines whether the engine speed  $N_e$  is larger than a first predetermined engine speed  $N_{e1}$ ; a secondary pulley cylinder hydraulic determining section that determines if a

difference ( $P_{\text{sec}} - P_1$ ) between a target secondary pulley hydraulic  $P_{\text{sec}}$  and a first set hydraulic  $P_1$  is larger than a second set hydraulic  $P_0$  when the engine speed  $N_e$  is higher than the first predetermined engine speed  $N_{e1}$ , a setting value setting section that sets a setting value  $P_{\text{min}}$  to determine if a deviation between the target cylinder secondary hydraulic  $P_{\text{sec}}$  and actual secondary pulley hydraulic  $P_{\text{sec}}$  is too large; a first secondary pulley hydraulic determining section that determines whether a difference ( $P_{\text{sec}} - P_{\text{sec}}$ ) between the target secondary pulley hydraulic  $P_{\text{sec}}$  and actual secondary pulley hydraulic  $P_{\text{sec}}$  is larger than the setting value  $P_{\text{min}}$ ; a second secondary pulley hydraulic determining section that determines whether the second secondary pulley hydraulic is smaller than a first set hydraulic ( $P_1$ ) when the difference between the target secondary pulley hydraulic  $P_{\text{sec}} - P_{\text{sec}}$  is larger than the setting value  $P_{\text{min}}$ ; and a pulley ratio determining section that determines whether a ratio of revolution speeds between the primary pulley and secondary pulley is larger than a predetermined gear ratio  $G_0$  when  $P_{\text{sec}}$  is smaller than first set hydraulic  $P_1$  and wherein the belt slip determination section determines that the belt slip occurs when the ratio of the revolution speed is larger than the predetermined gear ratio.

6. A control apparatus for an automotive vehicle as claimed in claim 5, wherein the output section comprises an overdrive determining section that determines whether an overdrive ratio occurs and the output section outputs different values of the torque

limitation demand values depending on whether the overdrive ratio occurs.

7. A control apparatus for an automotive vehicle  
5 as claimed in claim 6, wherein the output section outputs one of the torque limitation demand values  $T_1$  and  $T_2$  in which  $T_1 > T_2$  depending on whether the overdrive occurs.

10 8. A control apparatus for an automotive vehicle as claimed in claim 7, wherein after the output section outputs the engine speed increase demand signal to the engine control unit and, then, outputs a fuel cut-off recovery engine speed increase signal to the  
15 engine control unit and, when, during the deceleration, the engine speed is increased.

9. A control apparatus for an automotive vehicle as claimed in claim 8, wherein the belt slip determining  
20 section determines whether a vehicle is stopped and determines whether a line pressure is larger than a predetermined line pressure when the vehicle is determined to be stopped to determine whether the belt slip occurs.

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10. A control apparatus for an automotive vehicle, comprising:

an engine control unit;

an oil pump driven by an engine;

30 a continuously variable transmission associated with a vehicular engine and including a belt that transmits a revolution of a primary pulley to a secondary pulley that is enabled to make a gear shift

by modifying a pulley ratio between the primary and secondary pulleys with a hydraulic, continuously variable transmission including a belt to transmit a revolution of a primary pulley to a secondary pulley  
5 driven by a revolution of the engine; an original hydraulic supplying section that supplies an original hydraulic of a control hydraulic to control the pulley ratio with the oil pump as a hydraulic source; a gear shift actuator that supplies an original  
10 hydraulic for the control hydraulic that controls a pulley ratio with the oil pump as a hydraulic source; a gear shift actuator that supplies the control hydraulic to each pulley; and a gear shift controlling section that outputs a control command to  
15 the gear shift actuator; and an original hydraulic determining section that determines whether the original hydraulic of the original hydraulic supplying section is equal to or below a predetermined hydraulic when an engine idling is  
20 carried out during a vehicular stop; and an output section that outputs a signal to command the engine control unit to increase the engine idling speed by a predetermined engine speed.

25 11. A control method for an automotive vehicle, the vehicle comprising: a continuously variable transmission associated with the engine and including a belt that transmits a revolution of a primary pulley to a secondary pulley that is enabled to make  
30 a gear shift by modifying a pulley ratio between the primary and secondary pulleys with a hydraulic, and the method comprising:

determining if a belt slip between at least one  
of the primary and the secondary pulleys occurs; and  
outputting a signal to command an engine  
control unit to increase an engine speed by a  
5 predetermined engine speed at a time of determining  
that the slip therebetween occurs.

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